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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,756

09/01/2006

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EXAMINER

YEE, DEBORAH

ART UNIT

PAPER NUMBER

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/591,756	<b>Applicant(s)</b> IGARASHI ET AL.	
	<b>Examiner</b> Deborah Yee	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,7-19, 21 and 23 to 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,7-19,21 and 23 to 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 1 is indefinite because it recites "1.0% or less of a graphite-spheroidizing element" yet the total sum of the upper limit range of the listed spheroidizing elements (S, rare earth element and Mg) equals 0.27%.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 7 to 19, 21 and 23 to 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 61-1576655 (hereafter "JP-655") or German patent DE 2428821 (hereafter "DE-821") alone or in view of admitted prior art in paragraph [0003] of Applicant's specification for the reasons set forth in the previous office action dated January 28, 2009.

***Response to Arguments***

6. Applicant's arguments filed June 29, 2009 have been fully considered but they are not persuasive.

Art Unit: 1793

7. Applicant argued that the cast iron alloy of DE-821 has a bainitic to martensitic basic structure which is different from the claimed invention.

8. In response to argument, Applicant's claims 1 and 7 to 18 do not recite a specific microstructure (e.g. ferrite) as a limitation and therefore would not be a patentable consideration. Also Applicant's claims 19, 21 and 23 to 25 recite "cast iron having a structure comprising a matrix based on a ferrite phase in the as-cast state" which would appear to be met by DE-821 in the as-cast state since composition is closely met and is subjected to casting. DE-821 does teach a bainitic to martensitic structure but this structure only occurs after heat treatment and quenching.

9. Applicant argued that cast iron alloy of DE-821 does not contain the graphite-spheroidizing element, Mg, and does not teach or suggest any concept which relates to a graphite-spheroidizing element.

10. Contrary to Applicant's argument, DE-821 teaches a cast iron alloy with lamellar to **nodular** deposits of graphite and in order to refine the form of graphite (equivalent to spheroidizing), the elements B, and Bi, Zr, **Mg** and/or **rare-earth metals** may be added in the total concentration of up to 0.5%. See corresponding British patent 1,482,724 on page 2, column 1, lines 10 to 15 and lines 26 to 32. The prior art Mg and/or rare-earth metals up to 0.5% and S < 0.2% overlaps with Applicant's 0.005 to 0.2%Mg, 0.05% or less rare earth element and 0.003-0.02% S, respectively.

11. Applicant argued that specific cast iron alloy example meets the claimed  $Si + (2/7)W \leq 8$  but does not meet the composition defined in amended claim 1 containing less than 0.5% Ni, 0.3% or less Cr and 1.0% or less graphite-spheroidizing element.

Art Unit: 1793

Since specific prior art example does not meet the claimed composition entirely, then the claimed  $X_i/X_m$  and  $Y_i/Y_m$  ratios and  $Ac_1$  transformation point of  $840^{\circ}C$  or higher and all other recited properties would not be met.

12. In response to argument, it is the Examiner's position that despite the fact that DE-821 does exemplify a specific steel example that falls within all the claimed composition limitation, DE-821 still teaches a general steel composition having constituents whose wt% ranges overlap with those recited by Applicant's claims; and such overlap in wt% ranges establishes a prima facie case of obviousness.

13. As stated by Applicant, prior art example on pages 5 and 6 of DE-821 meets the claimed composition except for 0.6%Ni and 0.4%Cr and 1.0% or less spheroidizing agent. In regard to spheroidizing agent, prior art example contains 0.08% S and therefore meets the claimed range of up to 1.0% spheroidizing agent since S is listed as a spheroidizing agent. In addition, DE-821 teaches adding other spheroidizing agents such as Mg and rare earth element and therefore would be obvious and a matter of choice well within the skill of the artisan incorporate to prior art example, see lines 26 to 34 in column 2 on page 2 of corresponding British patent -724.

14. In addition prior art example meets the claimed Si and W content and when calculated, satisfies the  $Si + (2/7) W \leq 8$  equation. Since Si and W compositional criteria are met and process of making by casting to achieve property is met, then the claimed  $X_i/X_m$  and  $Y_i/Y_m$  ratios and other graphite limitations would be expected in absence of evidence to the contrary.

Art Unit: 1793

15. DE-821 contains 0.6%Ni and 0.4% Cr which are slightly outside the claimed Ni range of <0.5% and Cr range of  $\leq 0.3\%$ , respectively. Nevertheless, it would be obvious to lower Ni and Cr range since a broad range of 0.4 to 3.2% Ni and 0.3 to 2.5% Cr are taught by DE-821. To distinguish claims over prior art, Applicant will need to demonstrate (e.g. by comparative test data), that the more narrowly claimed Ni and Cr ranges are critical to produce new and unexpected results. Applicant's specification in paragraphs [0085]-[0088] teach higher Ni and Cr amounts would lower Ac1 temperature but this is merely Applicant's statement without any convincing evidence (e.g. comparative test data). Moreover, Applicant's claims 1, 7 to 13, and 15 to 18 do not recite Ac1 temperature and therefore limitation would not carry any patentable weight.

### ***Conclusion***

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 1793

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on monday-friday 6:00 am-2:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Deborah Yee/  
Primary Examiner  
Art Unit 1793

/DY/